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## SPACE OPERATIONS CONTROL CENTER

## SATELLITE SITUATION REPORT

VOL. 4, NO. 10

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MAY 31, 1964

NASA

GODDARD SPACE FLIGHT CENTER

GREENBELT, MD.

SPACE OPERATIONS CONTROL CENTER  
GODDARD SPACE FLIGHT CENTER  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

VOLUME 4 NO. 10

MAY 31, 1964

SATELLITE SITUATION REPORT

THE FOLLOWING REPORT REFLECTS DATA COMPUTED AND COMPILED BY  
THE GODDARD SPACE FLIGHT CENTER, NORAD, AND SMITHSONIAN ASTROPHYSICAL  
OBSERVATORY AS OF 1200Z ON MAY 31, 1964.

| OBJECT        | CODE NAME   | CATALOGUE<br>NUMBER | OBJECTS IN ORBIT |        |  | NODAL<br>PERIOD    | INCLI -<br>NATION | APOGEE<br>Km. | PERIGEE<br>Km. | TRANSMITTING<br>FREQ. (MC/S) |
|---------------|-------------|---------------------|------------------|--------|--|--------------------|-------------------|---------------|----------------|------------------------------|
|               |             |                     | SOURCE           | LAUNCH |  |                    |                   |               |                |                              |
| 1958 LAUNCHES |             |                     |                  |        |  |                    |                   |               |                |                              |
| ALPHA 1       | EXPLORER 1  | 004                 | US               | 1 FEB  |  | 104.6              | 33.18             | 1605          | 341            |                              |
| BETA 1        | ROCKET BODY | 016                 | US               | 17 MAR |  | 138.4              | 34.28             | 4322          | 647            |                              |
| BETA 2        | VANGUARD 1  | 005                 | US               | 17 MAR |  | 134.0              | 34.25             | 3958          | 630            | 108.012 &                    |
| 1959 LAUNCHES |             |                     |                  |        |  |                    |                   |               |                |                              |
| ALPHA 1       | VANGUARD 2  | 011                 | US               | 17 FEB |  | 125.4              | 32.86             | 3283          | 558            |                              |
| ALPHA 2       | ROCKET BODY | 012                 | US               | 17 FEB |  | 129.8              | 32.91             | 3682          | 540            |                              |
| ETA 1         | VANGUARD 3  | 020                 | US               | 18 FEB |  | 129.8              | 33.33             | 3717          | 511            |                              |
| MU 1*         | LUNIK 1     | 112                 | USSR             | 2 JAN  |  | HELIOCENTRIC ORBIT |                   |               |                |                              |
| NU 1*         | PIONEER 4   | 113                 | US               | 3 MAR  |  | HELIOCENTRIC ORBIT |                   |               |                |                              |
| IOTA 1        | EXPLORER 7  | 022                 | US               | 13 OCT |  | 101.2              | 50.31             | 1074          | 551            |                              |
| IOTA 2        | ROCKET BODY | 023                 | US               | 13 OCT |  | 100.9              | 50.30             | 1056          | 548            |                              |
| 1960 LAUNCHES |             |                     |                  |        |  |                    |                   |               |                |                              |
| ALPHA 1*      | PIONEER 5   | 027                 | US               | 11 MAR |  | HELIOCENTRIC ORBIT |                   |               |                |                              |
| BETA 1        | ROCKET BODY | 028                 | US               | 1 APR  |  | 99.1               | 48.40             | 749           | 683            |                              |
| BETA 2        | TIROS 1     | 029                 | US               | 1 APR  |  | 99.2               | 48.40             | 739           | 700            |                              |
| BETA 3        | NONE        | 101                 | US               | 1 APR  |  | 97.9               | 48.49             | 704           | 609            |                              |
| BETA 4        | NONE        | 115                 | US               | 1 APR  |  | 99.9               | 48.15             | 803           | 703            |                              |
| GAMMA 2       | TRANSIT 1B  | 031                 | US               | 13 APR |  | 94.0               | 51.22             | 589           | 346            |                              |
| GAMMA 4       | NONE        | 099                 | US               | 13 APR |  | 96.7               | 51.27             | 721           | 484            |                              |
| EPSILON 3     | NONE        | 036                 | USSR             | 15 MAY |  | 91.3               | 64.98             | 414           | 257            |                              |
| ZETA 1        | MIDAS 2     | 043                 | US               | 24 MAY |  | 94.3               | 33.04             | 494           | 473            |                              |
| ETA 1         | TRANSIT 2A  | 045                 | US               | 22 JUN |  | 101.6              | 66.72             | 1062          | 610            |                              |
| ETA 2         | GREB        | 046                 | US               | 22 JUN |  | 101.6              | 66.71             | 1059          | 610            |                              |
| ETA 3         | ROCKET BODY | 047                 | US               | 22 JUN |  | 101.4              | 66.69             | 1041          | 610            |                              |

OBJECTS IN ORBIT

| OBJECT                 | CODE NAME     | CATALOGUE<br>NUMBER | SOURCE | LAUNCH | NODAL<br>PERIOD                 | INCLI -<br>NATION | APOGEE<br>Km. | PERIGEE<br>Km. | TRANSMITTING<br>FREQ. (MC/S) |  |
|------------------------|---------------|---------------------|--------|--------|---------------------------------|-------------------|---------------|----------------|------------------------------|--|
| 1960 LAUNCHES (CONT'D) |               |                     |        |        |                                 |                   |               |                |                              |  |
| IOTA 1                 | ECHO 1        | 049                 | US     | 12 AUG | 114.4                           | 47.29             | 1846          | 1010           |                              |  |
| IOTA 2                 | ROCKET BODY   | 050                 | US     | 12 AUG | 118.1                           | 47.24             | 1679          | 1508           |                              |  |
| IOTA 3                 | METAL OBJECT  | 051                 | US     | 12 AUG | 118.2                           | 47.24             | 1679          | 1524           |                              |  |
| IOTA 4                 | METAL OBJECT  | 052                 | US     | 12 AUG | CURRENT ELEMENTS NOT MAINTAINED |                   |               |                |                              |  |
| IOTA 5                 | METAL OBJECT  | 053                 | US     | 12 AUG | 118.4                           | 47.28             | 1684          | 1536           |                              |  |
| NU 1                   | COURIER 1B    | 058                 | US     | 4 OCT  | 107.0                           | 28.31             | 1212          | 963            |                              |  |
| NU 2                   | ROCKET BODY   | 059                 | US     | 4 OCT  | 106.6                           | 28.23             | 1210          | 921            |                              |  |
| XI 1                   | EXPLORER 8    | 060                 | US     | 3 NOV  | 112.3                           | 49.94             | 2249          | 417            |                              |  |
| XI 2                   | ROCKET BODY   | 062                 | US     | 3 NOV  | 111.9                           | 49.91             | 2213          | 413            |                              |  |
| XI 3                   | NONE          | 069                 | US     | 3 NOV  | 109.3                           | 49.39             | 1987          | 402            |                              |  |
| XI 4                   | NONE          | 105                 | US     | 3 NOV  | 110.6                           | 50.51             | 2083          | 424            |                              |  |
| PI 1                   | TIROS 2       | 063                 | US     | 23 NOV | 98.2                            | 48.52             | 735           | 613            |                              |  |
| PI 2                   | ROCKET BODY   | 064                 | US     | 23 NOV | 98.1                            | 48.50             | 721           | 614            |                              |  |
| PI 3                   | NONE          | 074                 | US     | 23 NOV | 98.2                            | 48.49             | 733           | 607            |                              |  |
| PI 4                   | NONE          | 075                 | US     | 23 NOV | 98.3                            | 48.50             | 730           | 623            |                              |  |
| 1961 LAUNCHES          |               |                     |        |        |                                 |                   |               |                |                              |  |
| ALPHA 1                | SAMOS 2       | 070                 | US     | 31 JAN | 94.7                            | 97.40             | 544           | 469            |                              |  |
| ALPHA 2                | METAL OBJECT  | 079                 | US     | 31 JAN | 94.6                            | 97.41             | 540           | 466            |                              |  |
| GAMMA 1*               | VENUS PROBE   | 080                 | USSR   | 12 FEB | HELIOCENTRIC ORBIT              |                   |               |                |                              |  |
| DELTA 2                | ROCKET BODY   | 082                 | US     | 16 FEB | 118.5                           | 38.85             | 2586          | 639            |                              |  |
| DELTA 3                | NONE          | 085                 | US     | 16 FEB | CURRENT ELEMENTS NOT MAINTAINED |                   |               |                |                              |  |
| KAPPA 1                | EXPLORER 10   | 098                 | US     | 25 MAR | POSITION UNCERTAIN              |                   |               |                |                              |  |
| NU 1                   | EXPLORER 11   | 107                 | US     | 27 APR | 108.0                           | 28.78             | 1783          | 477            |                              |  |
| OMICRON 1              | TRANSIT 4A    | 116                 | US     | 29 JUN | 103.8                           | 66.82             | 999           | 880            | 150;400                      |  |
| OMICRON 2              | INJUN-SR-3    | 117                 | US     | 29 JUN | 103.8                           | 66.83             | 1003          | 877            |                              |  |
| OMICRON 3-206          | METAL OBJECTS |                     | US     | 29 JUN |                                 |                   |               |                |                              |  |
| RHO 1                  | TIROS 3       | 162                 | US     | 12 JUL | 100.4                           | 47.90             | 823           | 732            |                              |  |

| OBJECTS IN ORBIT       |                |                  |        |        |                                 |                |            |             |                           |
|------------------------|----------------|------------------|--------|--------|---------------------------------|----------------|------------|-------------|---------------------------|
| OBJECT                 | CODE NAME      | CATALOGUE NUMBER | SOURCE | LAUNCH | NODAL PERIOD                    | INCLI - NATION | APOGEE Km. | PERIGEE Km. | TRANSMITTING FREQ. (MC/S) |
| 1961 LAUNCHES (CONT'D) |                |                  |        |        |                                 |                |            |             |                           |
| RHO 2                  | ROCKET BODY    | 165              | US     | 12 JUL | 100.3                           | 47.92          | 822        | 726         |                           |
| RHO 3                  | METAL OBJECT   | 166              | US     | 12 JUL | 98.8                            | 47.92          | 797        | 610         |                           |
| RHO 4                  | METAL OBJECT   | 167              | US     | 12 JUL | 102.0                           | 47.85          | 930        | 776         |                           |
| SIGMA 1                | MIDAS 3        | 163              | US     | 12 JUL | 161.5                           | 91.14          | 3510       | 3381        |                           |
| SIGMA 3                | METAL OBJECT   | 188              | US     | 12 JUL | 161.6                           | 91.25          | 3591       | 3313        |                           |
| SIGMA 4                | METAL OBJECT   | 196              | US     | 12 JUL | 161.9                           | 91.22          | 3579       | 3345        |                           |
| UPSILON 1              | EXPLORER 12    | 170              | US     | 16 AUG | CURRENT ELEMENTS NOT MAINTAINED |                |            |             |                           |
| A DELTA 1              | MIDAS 4        | 192              | US     | 21 OCT | 166.0                           | 95.87          | 3730       | 3523        |                           |
| A DELTA 3              | METAL OBJECT   | 194              | US     | 21 OCT | 165.6                           | 95.84          | 3715       | 3507        |                           |
| A DELTA 4              | METAL OBJECT   | 195              | US     | 21 OCT | 166.4                           | 95.83          | 3774       | 3513        |                           |
| A ETA 1                | TRANSIT 4B     | 202              | US     | 15 NOV | 105.8                           | 32.43          | 1101       | 957         |                           |
| A ETA 2                | TRAAC          | 205              | US     | 15 NOV | 105.8                           | 32.41          | 1101       | 960         |                           |
| A ETA 3                | ROCKET BODY    | 204              | US     | 15 NOV | 105.6                           | 32.42          | 1104       | 942         |                           |
| 1962 LAUNCHES          |                |                  |        |        |                                 |                |            |             |                           |
| ALPHA 1*               | RANGER 3       | 221              | US     | 26 JAN | HELIOCENTRIC ORBIT              |                |            |             |                           |
| ALPHA 2*               | ROCKET BODY    | 222              | US     | 26 JAN | HELIOCENTRIC ORBIT              |                |            |             |                           |
| BETA 1                 | TIROS 4        | 226              | US     | 8 FEB  | 100.4                           | 48.31          | 849        | 702         |                           |
| BETA 2                 | ROCKET BODY    | 227              | US     | 8 FEB  | 101.4                           | 48.14          | 940        | 705         |                           |
| BETA 3                 | METAL OBJECT   | 228              | US     | 8 FEB  | 99.5                            | 48.42          | 768        | 697         |                           |
| BETA 4                 | METAL OBJECT   | 229              | US     | 8 FEB  | 100.3                           | 48.30          | 838        | 707         |                           |
| ZETA 1                 | ORB.SOL.OBS. 1 | 255              | US     | 7 MAR  | 96.0                            | 32.84          | 582        | 553         |                           |
| ZETA 2                 | ROCKET BODY    | 257              | US     | 7 MAR  | 96.0                            | 32.83          | 589        | 545         |                           |
| KAPPA 1                |                | 271              | US     | 9 APR  | 153.0                           | 86.69          | 3378       | 2819        |                           |
| KAPPA 3                |                | 273              | US     | 9 APR  | 152.6                           | 86.67          | 3366       | 2800        |                           |
| KAPPA 4                |                | 274              | US     | 9 APR  | 153.3                           | 86.68          | 3425       | 2801        |                           |
| MU 2                   | ROCKET BODY    | 282              | US     | 23 APR | HELIOCENTRIC ORBIT              |                |            |             |                           |
| OMICRON 1              | ARIEL 1        | 285              | US/UK  | 26 APR | 100.5                           | 53.87          | 1179       | 391         | 136.406                   |
| OMICRON 2              | ROCKET BODY    | 288              | US/UK  | 26 APR | 100.5                           | 53.86          | 1167       | 393         |                           |

| OBJECTS IN ORBIT       |              |        |        |        | CATALOGUE                       |        | PERIOD |      | INCLI -            |  | APOGEE |  | PERIGEE |  | TRANSMITTING |  |
|------------------------|--------------|--------|--------|--------|---------------------------------|--------|--------|------|--------------------|--|--------|--|---------|--|--------------|--|
| OBJECT                 | CODE NAME    | NUMBER | SOURCE | LAUNCH | PERIOD                          | NATION | Km.    | Km.  | FREQ. (MC/S)       |  |        |  |         |  |              |  |
| 1962 LAUNCHES (CONT'D) |              |        |        |        |                                 |        |        |      |                    |  |        |  |         |  |              |  |
| A ALPHA 1              | TIROS 5      | 309    | US     | 19 JUN | 100.5                           | 58.11  | 964    | 597  |                    |  |        |  |         |  |              |  |
| A ALPHA 2              | ROCKET BODY  | 311    | US     | 19 JUN | 100.4                           | 58.13  | 975    | 579  |                    |  |        |  |         |  |              |  |
| A ALPHA 3              | METAL OBJECT | 312    | US     | 19 JUN | 101.7                           | 58.21  | 1079   | 603  |                    |  |        |  |         |  |              |  |
| A ALPHA 4              | METAL OBJECT | 313    | US     | 19 JUN | 99.1                            | 58.01  | 851    | 581  |                    |  |        |  |         |  |              |  |
| A EPSILON 1            | TELSTAR 1    | 340    | US     | 10 JUL | 157.8                           | 44.79  | 5641   | 946  |                    |  |        |  |         |  |              |  |
| A EPSILON 2            | ROCKET BODY  | 341    | US     | 10 JUL | 157.6                           | 44.81  | 5626   | 949  |                    |  |        |  |         |  |              |  |
| A OMICRON 1            |              | 369    | US     | 23 AUG | 99.5                            | 98.70  | 861    | 614  |                    |  |        |  |         |  |              |  |
| A OMICRON 2            |              | 370    | US     | 23 AUG | 98.2                            | 98.66  | 753    | 599  |                    |  |        |  |         |  |              |  |
| A OMICRON 3            |              | 378    | US     | 23 AUG | 100.8                           | 98.71  | 970    | 623  |                    |  |        |  |         |  |              |  |
| A OMICRON 4            |              | 388    | US     | 23 AUG | 99.5                            | 98.68  | 854    | 620  |                    |  |        |  |         |  |              |  |
| A RHO 1*               | MARINER      | 374    | US     | 27 AUG | HELIOCENTRIC ORBIT              |        |        |      |                    |  |        |  |         |  |              |  |
| A RHO 2*               | ROCKET BODY  | 375    | US     | 27 AUG | HELIOCENTRIC ORBIT              |        |        |      |                    |  |        |  |         |  |              |  |
| A UPSILON 1            |              | 385    | US     | 1 SEP  | 91.3                            | 82.79  | 410    | 271  |                    |  |        |  |         |  |              |  |
| A PSI 1                | TIROS 6      | 397    | US     | 18 SEP | 98.7                            | 58.31  | 713    | 683  |                    |  |        |  |         |  |              |  |
| A PSI 2                | ROCKET BODY  | 398    | US     | 18 SEP | 98.7                            | 58.33  | 704    | 686  |                    |  |        |  |         |  |              |  |
| A PSI 3                | METAL OBJECT | 399    | US     | 18 SEP | 99.4                            | 58.44  | 776    | 682  |                    |  |        |  |         |  |              |  |
| A PSI 4                | METAL OBJECT | 400    | US     | 18 SEP | 98.0                            | 58.22  | 690    | 639  |                    |  |        |  |         |  |              |  |
| B ALPHA 1              | ALOUETTE     | 424    | CANADA | 29 SEP | 105.5                           | 80.47  | 1034   | 1002 | 136.978            |  |        |  |         |  |              |  |
|                        |              |        |        |        |                                 |        |        |      | \$136.591\$136.077 |  |        |  |         |  |              |  |
| B ALPHA 2              | ROCKET BODY  | 426    | US     | 29 SEP | 105.4                           | 80.47  | 1029   | 1002 |                    |  |        |  |         |  |              |  |
| B ALPHA 3              | METAL OBJECT | 510    | US     | 29 SEP | 105.4                           | 80.50  | 1028   | 997  |                    |  |        |  |         |  |              |  |
| B ALPHA 4              | METAL OBJECT | 511    | US     | 29 SEP | 105.5                           | 80.43  | 1046   | 990  |                    |  |        |  |         |  |              |  |
| B GAMMA 1              | EXPLORER 14  | 432    | US     | 2 OCT  | CURRENT ELEMENTS NOT MAINTAINED |        |        |      |                    |  |        |  |         |  |              |  |
| B GAMMA 2#             | ROCKET BODY  | NNA    | US     | 2 OCT  | CURRENT ELEMENTS NOT MAINTAINED |        |        |      |                    |  |        |  |         |  |              |  |
| B ETA 1*               | RANGER 5     | 439    | US     | 18 OCT | HELIOCENTRIC ORBIT              |        |        |      |                    |  |        |  |         |  |              |  |
| B ETA 2*               | ROCKET BODY  | 440    | US     | 18 OCT | HELIOCENTRIC ORBIT              |        |        |      |                    |  |        |  |         |  |              |  |
| B KAPPA 1              |              | 444    | US     | 26 OCT | 134.4                           | 71.41  | 4422   | 199  |                    |  |        |  |         |  |              |  |
| B LAMBDA 1             | EXPLORER 15  | 445    | US     | 27 OCT | 312.6                           | 18.04  | 17440  | 307  |                    |  |        |  |         |  |              |  |

| OBJECTS IN ORBIT       |             |                  |        |        |                                 |                |            |             |                           |  |  |  |  |
|------------------------|-------------|------------------|--------|--------|---------------------------------|----------------|------------|-------------|---------------------------|--|--|--|--|
| OBJECT                 | CODE NAME   | CATALOGUE NUMBER | SOURCE | LAUNCH | NODAL PERIOD                    | INCLI - NATION | APOGEE Km. | PERIGEE Km. | TRANSMITTING FREQ. (MC/S) |  |  |  |  |
| 1962 LAUNCHES (CONT'D) |             |                  |        |        |                                 |                |            |             |                           |  |  |  |  |
| B LAMBDA 2#            | ROCKET BODY | NNA              | US     | 27 OCT | INSUFFICIENT OBSERVATIONS       |                |            |             |                           |  |  |  |  |
| B MU 1                 | ANNA 1B     | 446              | US     | 31 OCT | 107.9                           | 50.16          | 1174       | 1085        | 162;324                   |  |  |  |  |
| B MU 2                 | ROCKET BODY | 447              | US     | 31 OCT | 107.6                           | 50.15          | 1162       | 1070        |                           |  |  |  |  |
| B NU 3*                |             | 450              | USSR   | 1 NOV  | HELIOCENTRIC ORBIT              |                |            |             |                           |  |  |  |  |
| B TAU 1                |             | 502              | US     | 13 DEC | 110.4                           | 70.35          | 2258       | 233         |                           |  |  |  |  |
| B TAU 2                | INJUN 3     | 504              | US     | 13 DEC | 113.0                           | 70.33          | 2492       | 239         |                           |  |  |  |  |
| B TAU 4                |             | 508              | US     | 13 DEC | 107.4                           | 70.38          | 1989       | 223         |                           |  |  |  |  |
| B TAU 5                |             | 513              | US     | 13 DEC | 110.3                           | 70.35          | 2245       | 232         |                           |  |  |  |  |
| B TAU 6                |             | 520              | US     | 13 DEC | 112.4                           | 70.42          | 2443       | 235         |                           |  |  |  |  |
| B UPSILON 1            | RELAY 1     | 503              | US     | 13 DEC | 185.1                           | 47.52          | 7447       | 1311        | 136.140                   |  |  |  |  |
|                        |             |                  |        |        |                                 |                |            |             | \$136.620                 |  |  |  |  |
| B UPSILON 2            | ROCKET BODY | 515              | US     | 13 DEC | 184.9                           | 47.53          | 7431       | 1310        |                           |  |  |  |  |
| B CHI 1                | EXPLORER 16 | 506              | US     | 16 DEC | 104.4                           | 52.01          | 1188       | 741         |                           |  |  |  |  |
| B PSI 1                | TRANSIT 5A  | 509              | US     | 19 DEC | 99.1                            | 90.64          | 730        | 702         |                           |  |  |  |  |
| B PSI 2                |             | 514              | US     | 19 DEC | 97.7                            | 90.75          | 726        | 575         |                           |  |  |  |  |
| B PSI 3                |             | 519              | US     | 19 DEC | 99.1                            | 90.63          | 731        | 700         |                           |  |  |  |  |
| B PSI 4                |             | 523              | US     | 19 DEC | 100.2                           | 90.48          | 839        | 700         |                           |  |  |  |  |
| 1963 LAUNCHES          |             |                  |        |        |                                 |                |            |             |                           |  |  |  |  |
| 1963 03A               |             | 527              | US     | 16 JAN | 94.5                            | 81.89          | 528        | 462         |                           |  |  |  |  |
| 1963 04A               | SYNCOM 1    | 553              | US     | 14 FEB | CURRENT ELEMENTS NOT MAINTAINED |                |            |             |                           |  |  |  |  |
| 1963 04B               | ROCKET BODY | 532              | US     | 14 FEB | CURRENT ELEMENTS NOT MAINTAINED |                |            |             |                           |  |  |  |  |
| 1963 05A               |             | 533              | US     | 19 FEB | 97.7                            | 100.50         | 798        | 501         |                           |  |  |  |  |
| 1963 05B               |             | 534              | US     | 19 FEB | 97.7                            | 100.51         | 797        | 503         |                           |  |  |  |  |
| 1963 05C               |             | 535              | US     | 19 FEB | 96.9                            | 100.51         | 752        | 471         |                           |  |  |  |  |
| 1963 05D               |             | 536              | US     | 19 FEB | 98.3                            | 100.50         | 833        | 529         |                           |  |  |  |  |
| 1963 08B               |             | 566              | USSR   | 2 APR  | BARYCENTRIC ORBIT               |                |            |             |                           |  |  |  |  |
| 1963 09A               | EXPLORER 17 | 564              | US     | 3 APR  | 95.2                            | 57.62          | 797        | 257         |                           |  |  |  |  |
| 1963 13A               | TELSTAR 2   | 573              | US     | 7 MAY  | 225.3                           | 42.74          | 10807      | 965         | 136.050                   |  |  |  |  |

OBJECTS IN ORBIT

| <u>OBJECT</u>                 | <u>CODE NAME</u>                        | <u>CATALOGUE<br/>NUMBER</u> | <u>SOURCE</u> | <u>LAUNCH</u> | <u>NODAL<br/>PERIOD</u>         | <u>INCLI-<br/>NATION</u> | <u>APOGEE<br/>Km.</u> | <u>PERIGEE<br/>Km.</u> | <u>TRANSMITTING<br/>FREQ. (MC/S)</u> |
|-------------------------------|---|-----------------------------|---------------|---------------|---------------------------------|--------------------------|-----------------------|------------------------|--------------------------------------|
| <b>1963 LAUNCHES (CONT'D)</b> |   |                             |               |               |                                 |                          |                       |                        |                                      |
| 1963 13B                      | ROCKET BODY                             | 575                         | US            | 7 MAY         | 225.1                           | 42.64                    | 10791                 | 965                    |                                      |
| 1963 14A                      |   | 574                         | US            | 9 MAY         | 166.4                           | 87.31                    | 3712                  | 3579                   |                                      |
| 1963 14B                      |   | 579                         | US            | 9 MAY         | 166.4                           | 87.24                    | 3738                  | 3554                   |                                      |
| 1963 14C                      |   | 608                         | US            | 9 MAY         | 166.4                           | 87.35                    | 3652                  | 3639                   |                                      |
| 1963 14D                      |   | 589                         | US            | 9 MAY         | CURRENT ELEMENTS NOT MAINTAINED |                          |                       |                        |                                      |
| 1963 14E                      |   | 602                         | US            | 9 MAY         | 166.1                           | 87.36                    | 3641                  | 3621                   |                                      |
| 1963 14F                      |   | 628                         | US            | 9 MAY         | 166.8                           | 87.39                    | 3691                  | 3631                   |                                      |
| 1963 14G                      |   | 629                         | US            | 9 MAY         | 166.4                           | 87.34                    | 3651                  | 3639                   |                                      |
| 1963 14H                      |   | 702                         | US            | 9 MAY         | 166.4                           | 87.38                    | 3756                  | 3534                   |                                      |
| 1963 17A                      |   | 580                         | USSR          | 22 MAY        | 93.0                            | 48.95                    | 588                   | 254                    |                                      |
| 1963 17C                      |   | 582                         | USSR          | 22 MAY        | 94.3                            | 49.20                    | 638                   | 330                    |                                      |
| 1963 22A                      |   | 594                         | US            | 16 JUN        | 99.7                            | 90.01                    | 759                   | 732                    | 150;400                              |
| 1963 22B                      |   | 603                         | US            | 16 JUN        | 99.7                            | 90.00                    | 762                   | 729                    |                                      |
| 1963 22C                      |   | 610                         | US            | 16 JUN        | 101.2                           | 90.18                    | 882                   | 754                    |                                      |
| 1963 22D                      |   | 611                         | US            | 16 JUN        | 98.1                            | 89.83                    | 778                   | 566                    |                                      |
| 1963 24A                      | TIROS 7                                 | 604                         | US            | 19 JUN        | 97.4                            | 58.23                    | 653                   | 619                    | 136.233;<br>136.921                  |
| 1963 24B                      | ROCKET BODY                             | 605                         | US            | 19 JUN        | 97.4                            | 58.22                    | 647                   | 617                    |                                      |
| 1963 24C                      | METAL OBJECT                            | 606                         | US            | 19 JUN        | 97.9                            | 58.37                    | 684                   | 631                    |                                      |
| 1963 24D                      | METAL OBJECT                            | 607                         | US            | 19 JUN        | 96.9                            | 58.10                    | 644                   | 576                    |                                      |
| 1963 25B                      |   | 614                         | US            | 27 JUN        | 132.4                           | 82.11                    | 4113                  | 341                    |                                      |
| 1963 26A                      | RESEARCH<br>SATELLITE FOR<br>GEOPHYSICS | 612                         | US            | 28 JUN        | 102.1                           | 49.73                    | 1299                  | 414                    |                                      |
| 1963 27A                      |   | 613                         | US            | 29 JUN        | 94.7                            | 82.32                    | 523                   | 488                    |                                      |
| 1963 27B                      |   | 615                         | US            | 29 JUN        | 93.3                            | 82.30                    | 441                   | 433                    |                                      |
| 1963 30A                      |   | 622                         | US            | 19 JUL        | 167.8                           | 88.45                    | 3744                  | 3661                   |                                      |
| 1963 30B                      |   | 635                         | US            | 19 JUL        | 167.8                           | 88.41                    | 3731                  | 3674                   |                                      |
| 1963 30C                      |   | 630                         | US            | 19 JUL        | 167.5                           | 88.50                    | 3712                  | 3665                   |                                      |
| 1963 30D                      |   | 624                         | US            | 19 JUL        | 167.9                           | 88.34                    | 4109                  | 3300                   |                                      |
| 1963 30E                      |   | 631                         | US            | 19 JUL        | 168.3                           | 88.44                    | 3770                  | 3669                   |                                      |



| <u>OBJECTS IN ORBIT</u> |                  |                             |               |               |                         |                          |                       |                        |  |
|-------------------------|------------------|-----------------------------|---------------|---------------|-------------------------|--------------------------|-----------------------|------------------------|--|
| <u>OBJECT</u>           | <u>CODE NAME</u> | <u>CATALOGUE<br/>NUMBER</u> | <u>SOURCE</u> | <u>LAUNCH</u> | <u>NODAL<br/>PERIOD</u> | <u>INCLI-<br/>NATION</u> | <u>APOGEE<br/>Km.</u> | <u>PERIGEE<br/>Km.</u> | <u>TRANSMITTING<br/>FREQ. (MC/S)</u>                       |
| 1963 LAUNCHES (CONT'D)  |                  |                             |               |               |                         |                          |                       |                        |  |
| 1963 31A                | SYNCOM 2         | 634                         | US            | 26 JUL        | 1439.3                  | 32.63                    | 35903                 | 35796                  | \$136.980;<br>\$136.468\$1814.069;<br>\$1815.794\$1820.177 |
| 1963 31B                | ROCKET BODY      | 625                         | US            | 26 JUL        | CURRENT                 | ELEMENTS                 | NOT MAINTAINED        |                        |  |
| 1963 38A                |                  | 669                         | US            | 28 SEP        | 107.1                   | 89.91                    | 1106                  | 1081                   |  |
| 1963 38B                |                  | 670                         | US            | 28 SEP        | 107.4                   | 89.90                    | 1134                  | 1077                   |  |
| 1963 38C                |                  | 671                         | US            | 28 SEP        | 107.3                   | 89.91                    | 1133                  | 1077                   | 136.652  |
| 1963 38D                |                  | 672                         | US            | 28 SEP        | 107.3                   | 89.92                    | 1140                  | 1070                   |  |
| 1963 38E                |                  | 745                         | US            | 28 SEP        | 107.1                   | 89.92                    | 1114                  | 1072                   |  |
| 1963 39A                |                  | 674                         | US            | 17 OCT        | 6484.8                  | 38.59                    | 116494                | 101136                 |  |
| 1963 39B                |                  | 675                         | US            | 17 OCT        | 2319.4                  | 35.90                    | 102372                | 953                    |  |
| 1963 39C                |                  | 692                         | US            | 17 OCT        | 6512.4                  | 37.81                    | 116069                | 102212                 |  |
| 1963 42B                |                  | 682                         | US            | 29 OCT        | 92.5                    | 89.99                    | 508                   | 290                    |  |
| 1963 43A                | POLYOT 1         | 683                         | USSR          | 1 NOV         | 102.4                   | 58.94                    | 1404                  | 339                    |  |
| 1963 43B                |                  | 684                         | USSR          | 1 NOV         | 101.5                   | 58.66                    | 1322                  | 333                    |  |
| 1963 43C                |                  | 685                         | USSR          | 1 NOV         | 99.4                    | 58.99                    | 1161                  | 303                    |  |
| 1963 43D                |                  | 686                         | USSR          | 1 NOV         | 101.2                   | 59.81                    | 1282                  | 344                    | 136.112  |
| 1963 46A                | EXPLORER 18      | 693                         | US            | 27 NOV        | 5553.84                 | 35.438                   | 193894                | 1873                   |  |
| 1963 47A                | CENTAUR 2        | 694                         | US            | 27 NOV        | 107.8                   | 30.36                    | 1785                  | 464                    |  |
| 1963 47B                |                  | 696                         | US            | 27 NOV        | 107.3                   | 30.06                    | 1623                  | 574                    |  |
| 1963 47C                |                  | 697                         | US            | 27 NOV        | 107.5                   | 30.07                    | 1628                  | 591                    |  |
| 1963 47D                |                  | 698                         | US            | 27 NOV        | 108.0                   | 29.92                    | 1652                  | 616                    |  |
| 1963 47E                |                  | 699                         | US            | 27 NOV        | 108.7                   | 30.51                    | 1748                  | 577                    |  |
| 1963 47F                |                  | 700                         | US            | 27 NOV        | 108.7                   | 30.48                    | 1771                  | 554                    |  |
| 1963 47G                |                  | 701                         | US            | 27 NOV        | 107.8                   | 30.00                    | 1635                  | 615                    |  |
| 1963 47H                |                  | 739                         | US            | 27 NOV        | 107.8                   | 30.39                    | 1680                  | 561                    |  |
| 1963 49A                |                  | 703                         | US            | 5 DEC         | 106.8                   | 89.95                    | 1096                  | 1063                   | 150;400  |
| 1963 49B                |                  | 704                         | US            | 5 DEC         | 107.1                   | 89.97                    | 1125                  | 1065                   |  |

# OBJECTS IN ORBIT

| <u>OBJECT</u>                 | <u>CODE NAME</u> | <u>CATALOGUE<br/>NUMBER</u> | <u>SOURCE</u> | <u>LAUNCH</u> | <u>NODAL<br/>PERIOD</u> | <u>INCLI -<br/>NATION</u> | <u>APOGEE<br/>Km.</u> | <u>PERIGEE<br/>Km.</u> | <u>TRANSMITTING<br/>FREQ. (MC/S)</u> |
|-------------------------------|------------------|-----------------------------|---------------|---------------|-------------------------|---------------------------|-----------------------|------------------------|--------------------------------------|
| <b>1963 LAUNCHES (CONT'D)</b> |                  |                             |               |               |                         |                           |                       |                        |                                      |
| 1963 49C                      |                  | 705                         | US            | 5 DEC         | 107.1                   | 89.95                     | 1118                  | 1070                   | 54;162;324;648                       |
| 1963 49D                      |                  | 706                         | US            | 5 DEC         | 107.1                   | 89.96                     | 1125                  | 1059                   |                                      |
| 1963 49E                      |                  | 715                         | US            | 5 DEC         | 107.1                   | 89.98                     | 1121                  | 1068                   |                                      |
| 1963 49F                      |                  | 753                         | US            | 5 DEC         | 107.1                   | 89.97                     | 1136                  | 1053                   |                                      |
| 1963 53A                      | EXPLORER 19      | 714                         | US            | 19 DEC        | 115.7                   | 78.63                     | 2363                  | 609                    |                                      |
| 1963 53B                      |                  | 721                         | US            | 19 DEC        | 115.8                   | 78.57                     | 2383                  | 601                    |                                      |
| 1963 53C                      |                  | 722                         | US            | 19 DEC        | 115.9                   | 78.66                     | 2386                  | 612                    |                                      |
| 1963 53D                      |                  | 723                         | US            | 19 DEC        | 115.9                   | 78.66                     | 2392                  | 603                    |                                      |
| 1963 53E                      |                  | 724                         | US            | 19 DEC        | 115.8                   | 78.64                     | 2385                  | 599                    |                                      |
| 1963 53F                      |                  | 725                         | US            | 19 DEC        | 115.9                   | 78.66                     | 2392                  | 599                    |                                      |
| 1963 53G                      |                  | 726                         | US            | 19 DEC        | 115.8                   | 78.65                     | 2382                  | 606                    |                                      |
| 1963 53H                      |                  | 732                         | US            | 19 DEC        | 115.8                   | 78.63                     | 2355                  | 632                    |                                      |
| 1963 54A                      | TIROS 8          | 716                         | US            | 21 DEC        | 99.4                    | 58.52                     | 747                   | 709                    | 136.233<br>136.924                   |
| 1963 54B                      |                  | 717                         | US            | 21 DEC        | 99.3                    | 58.50                     | 743                   | 708                    |                                      |
| 1963 54C                      |                  | 720                         | US            | 21 DEC        | 101.1                   | 58.49                     | 913                   | 706                    |                                      |
| 1963 54D                      |                  | 736                         | US            | 21 DEC        | 97.7                    | 58.52                     | 716                   | 580                    |                                      |
| 1963 55B                      |                  | 719                         | US            | 21 DEC        | 91.0                    | 64.53                     | 360                   | 291                    |                                      |
| <b>1964 LAUNCHES</b>          |                  |                             |               |               |                         |                           |                       |                        |                                      |
| 1964 1A                       |                  | 727                         | US            | 11 JAN        | 103.4                   | 69.92                     | 933                   | 912                    |                                      |
| 1964 1B                       | GCSE             | 728                         | US            | 11 JAN        | 103.4                   | 70.10                     | 979                   | 866                    |                                      |
| 1964 1C                       | EGRS             | 729                         | US            | 11 JAN        | 103.4                   | 69.91                     | 934                   | 911                    | 136.805                              |
| 1964 1D                       | SOLAR RADIATION  | 730                         | US            | 11 JAN        | 103.5                   | 69.93                     | 932                   | 914                    | 136.887                              |
| 1964 1E                       |                  | 731                         | US            | 11 JAN        | 103.5                   | 69.92                     | 935                   | 911                    |                                      |
| 1964 2A                       |                  | 733                         | US            | 19 JAN        | 101.3                   | 99.05                     | 838                   | 808                    |                                      |
| 1964 2B                       |                  | 734                         | US            | 19 JAN        | 101.3                   | 99.05                     | 829                   | 811                    |                                      |
| 1964 2C                       |                  | 735                         | US            | 19 JAN        | 101.3                   | 99.06                     | 832                   | 811                    |                                      |
| 1964 3A                       | RELAY 2          | 737                         | US            | 21 JAN        | 194.7                   | 46.33                     | 7419                  | 2080                   | 136.141<br>\$136.621                 |

# OBJECTS IN ORBIT

| <u>OBJECT</u>          | <u>CODE NAME</u> | <u>CATALOGUE<br/>NUMBER</u> | <u>SOURCE</u> | <u>LAUNCH</u> | <u>NODAL<br/>PERIOD</u> | <u>INCLI-<br/>NATION</u> | <u>APOGEE<br/>Km.</u> | <u>PERIGEE<br/>Km.</u> | <u>TRANSMITTING<br/>FREQ. (MC/S)</u> |
|------------------------|------------------|-----------------------------|---------------|---------------|-------------------------|--------------------------|-----------------------|------------------------|--------------------------------------|
| 1964 LAUNCHES (CONT'D) |                  |                             |               |               |                         |                          |                       |                        |                                      |
| 1964 03B               |                  | 738                         | US            | 21 JAN        | 194.8                   | 46.32                    | 7419                  | 2086                   |                                      |
| 1964 04A               | ECHO 2           | 740                         | US            | 25 JAN        | 108.7                   | 81.51                    | 1303                  | 1036                   | 136.020;<br>136.170                  |
| 1964 04B               |                  | 741                         | US            | 25 JAN        | 108.9                   | 81.51                    | 1310                  | 1047                   |                                      |
| 1964 04C               |                  | 742                         | US            | 25 JAN        | 108.8                   | 81.48                    | 1307                  | 1042                   |                                      |
| 1964 04D               |                  | 743                         | US            | 25 JAN        | 108.8                   | 81.55                    | 1307                  | 1041                   |                                      |
| 1964 04E               |                  | 749                         | US            | 25 JAN        | 99.5                    | 81.55                    | 1177                  | 293                    |                                      |
| 1964 05A               | SATURN 5         | 744                         | US            | 29 JAN        | 94.3                    | 31.43                    | 708                   | 259                    |                                      |
| 1964 06A               | ELEKTRON 1       | 746                         | USSR          | 30 JAN        | 169.3                   | 60.86                    | 7119                  | 402                    |                                      |
| 1964 06B               | ELEKTRON 2       | 748                         | USSR          | 30 JAN        | 1356.4                  | 60.07                    | 67924                 | 500                    |                                      |
| 1964 06C               |                  | 750                         | USSR          | 30 JAN        | 168.2                   | 60.84                    | 7034                  | 399                    |                                      |
| 1964 06D               |                  | 751                         | USSR          | 30 JAN        | 1384.2                  | 59.98                    | 69016                 | 512                    |                                      |
| 1964 10A               | COSMOS 25        | 757                         | USSR          | 27 FEB        | 91.5                    | 49.01                    | 442                   | 256                    |                                      |
| 1964 10B               |                  | 758                         | USSR          | 27 FEB        | 89.9                    | 48.99                    | 312                   | 221                    |                                      |
| 1964 11A               |                  | 759                         | US            | 29 FEB        | 94.6                    | 82.07                    | 516                   | 490                    |                                      |
| 1964 11B               |                  | 760                         | US            | 29 FEB        | 94.4                    | 82.06                    | 499                   | 481                    |                                      |
| 1964 11C               |                  | 761                         | US            | 29 FEB        | 94.5                    | 82.08                    | 508                   | 480                    |                                      |
| 1964 13A               | COSMOS 26        | 766                         | USSR          | 18 MAR        | 90.5                    | 48.97                    | 339                   | 257                    |                                      |
| 1964 15A               | ARIEL 2          | 771                         | US/UK         | 27 MAR        | 101.2                   | 51.67                    | 1341                  | 289                    | 136.447                              |
| 1964 15B               |                  | 775                         | US/UK         | 27 MAR        | 101.1                   | 51.69                    | 1329                  | 289                    |                                      |
| 1964 16D               |                  | 785                         | USSR          | 2 APR         | HELIOCENTRIC ORBIT      |                          |                       |                        |                                      |
| 1964 19B               | POLYOT 2         | 784                         | USSR          | 12 APR        | 92.3                    | 58.06                    | 472                   | 304                    |                                      |
| 1964 23B               |                  | 798                         | USSR          | 18 MAY        | 89.6                    | 64.89                    | 260                   | 202                    |                                      |
| 1964 25A               | SATURN 6         | 800                         | US            | 29 MAY        | 88.1                    | 31.77                    | 168                   | 168                    |                                      |

PLEASE ADD THE FOLLOWING TO THE DECAY OBJECTS LIST:

| <u>OBJECT</u>  | <u>CODE NAME</u> | <u>CATALOGUE<br/>NUMBER</u> | <u>SOURCE</u> | <u>LAUNCH</u> | <u>DECAY</u>     |
|----------------|------------------|-----------------------------|---------------|---------------|------------------|
| 1962 B-THETA 1 |                  | 441                         | USSR          | 20 OCT        | 18 MAY 64        |
| 1964 13B       |                  | 767                         | USSR          | 18 MAR        | 17 MAY 64        |
| 1964 19A       |                  | 783                         | USSR          | 12 APR        | 30 APR-01 MAY 64 |
| 1964 22A       |                  | 796                         | US            | 27 APR        | 26 MAY 64        |
| 1964 23A       | COSMOS 30        | 797                         | USSR          | 18 MAY        | 26 MAY 64        |
| 1964 24A       |                  | 799                         | US            | 19 MAY        | 22 MAY 64        |
| 1964 21B       |                  | 792                         | USSR          | 25 APR        | 11 MAY 64        |

- \* APHELION PERIHELION IN ASTRONOMICAL UNITS, INCLINATION TO ECLIPTIC.  
 \*\* TWO HUNDRED AND FOUR METAL OBJECTS HAVE BEEN IDENTIFIED AS HAVING BEEN LAUNCHED WITH  
 1961 OMICRON 1 AND 1961 OMICRON 2. OBJECTS OF THIS SERIES THAT HAVE DECAYED CAN BE  
 FOUND IN THE DECAYED OBJECTS LISTS.  
 \$ TRANSMITTING ON COMMAND ONLY.  
 & TRANSMITTING WHEN IN SUNLIGHT ONLY.  
 # NO CATALOGUE NUMBER ASSIGNED.